

VECTOR DIAGRAMS

Teaching Guidelines

Subject: Science

Topics: Physics

Grades: 9-12

Concepts:

- Understands the concept "force"
- Understands the concept "vector"

Knowledge and Skills:

- Can add vectors to determine resultant force or velocity

Subject: Mathematics

Topics: Trigonometric ratios

Grades: 9 – 12

Knowledge and Skills:

- Can solve real world problems involving trigonometric ratios

Subject: Technology

Topics: Transportation

Grades: 9 – 12

Knowledge and Skills:

- Understands the four forces which act on a vehicle operating in powered flight and their relationships to each other and to the resultant force on the vehicle

Materials: None

Procedure:

This project should be done by students individually or in teams of two.

Distribute the handout and discuss it. Ensure that students understand the assignment.

You may wish to specify the form of vector addition that you want students to use in solving the given problems.

Give students a schedule for working on the assignment and a due date.

Answers:

#1: +360 pounds horizontal (forward), plane will continue forward motion.

#2: -270 pounds horizontal (backwards), plane will decelerate

#3: 390 pounds, 30° up from horizontal forward. Plane will ascend.

The tech manuals team asked us to come up with a few vector diagrams to show various conditions of flight for our new 4-seater. Would you do me a big favor and work out the resultants for these 3 force diagrams and check the correct behavior description?

Thanks.

P.S. These drawings are not to scale. But if a line looks horizontal or vertical, then it is.

